Indiana Department of Education
Academic Standards Course Framework

ARCHITECHTURAL DRAFTING AND DESIGN I

Architectural Drafting and Design I Gives students a basic understanding of the detailing skills commonly used by drafting technicians. Areas of study include: lettering, sketching, proper use of equipment, geometric constructions with emphasis on orthographic (multi-view) drawings that are dimensioned and noted to ANSI standards. This course includes the creation and interpretation of construction documents. Methods of geometric construction, three dimensional drawing techniques, and sketching will be presented as well as elementary aspects of residential design and site work. Areas of emphasis will include print reading and drawing. This course also provides students with a basic understanding of the features and considerations associated with the operation of a computer-aided design (CAD) system. Students will gain valuable hands-on experience with Auto CAD. They will be expected to complete several projects relating to command topics. Topics include: 2D drawing commands, coordinate systems, editing commands, paper and model space, inquiry commands, layers, plotting, text, and basic dimensioning.

- DOE Code: 5640
- Recommended Grade Level: Grade 11-12
- Recommended Prerequisites: Computers in Design and Production
- Credits: 2-3 credits per semester, maximum of 6 credits
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- This course is aligned with postsecondary courses for Dual Credit
    - Ivy Tech
        - DESN 102- Technical Graphics
        - DESN 103- CAD Fundamentals
    - Vincennes University
        - ARCH 102- Architectural Drawing
        - ARCH 141- Introduction to Architectural CAD

Dual Credit
This course provides the opportunity for dual credit for students who meet postsecondary requirements for earning dual credit and successfully complete the dual credit requirements of this course.

Application of Content and Multiple Hour Offerings
Intensive laboratory applications are a component of this course and may be either school based or work based or a combination of the two. Work-based learning experiences should be in a closely related industry setting. Instructors shall have a standards-based training plan for students participating in work-based learning experiences. When a course is offered for multiple hours per semester, the amount of laboratory application or work-based learning needs to be increased proportionally.

Career and Technical Student Organizations (CTSOs)
Career and Technical Student Organizations are considered a powerful instructional tool when integrated into Career and Technical Education programs. They enhance the knowledge and skills students learn in a course by allowing a student to participate in a unique program of career and leadership development. Students should be encouraged to participate in SkillsUSA, the CTSO for this area.

Content Standards

Domain – Utilizing the Design Process in Architectural Drafting

Core Standard 1 Students apply and adapt the design process to challenges found in architectural drafting scenarios.

Standards

ADDI-1.1 Identify and utilize the design process

ADDI-1.2 Recognize that budget constraints and customer needs are part of the design process

ADDI-1.3 Interpret demographics in an given area and relate it to the design process

Domain – Drawing Concepts in Architectural Drafting

Core Standard 2 Students integrate architectural concepts to produce industry standard drawings.

Standards

Standards

ADDI-2.1 Use various architectural and construction terminology correctly

ADDI-2.2 Show familiarity with conventional drafting standards

ADDI-2.3 Identify and demonstrate proper use of drafting equipment

ADDI-2.4 Identify pictorial, isometric, and orthographic drawing types

ADDI-2.5 Sketch proportionately and recognizably a given object

ADDI-2.6 Demonstrate advanced design sketching

ADDI-2.7 Demonstrate vertical Gothic lettering to quality standards

ADDI-2.8 Interpret scaled detailed drawings

ADDI-2.9 Identify and utilize drafting symbols

ADDI-2.10 Demonstrate acceptable line work and construction techniques

ADDI-2.11 Use and interpret sectioning techniques involving numerous line types

ADDI-2.12 Interpret residential planning and bubble diagrams

ADDI-2.13 Read an architectural scale

ADDI-2.14 Understand how to make a drawing to-scale

Domain – Utilization of CAD Software in Architecture

Core Standard 3 Students select specific commands to develop drawings to meet industry standards.

Standards

ADDI-3.1 Demonstrate competence in the use of CAD software through assignments

ADDI-3.2 Correctly use word processing and CAD file exporting commands when completing assignments

ADDI-3.3 Identify and use multiple input methods to select commands on the CAD system

ADDI-3.4 Retrieve and use help commands

ADDI-3.5 Navigate through and identify various parts of the CAD environment

ADDI-3.6 Modify drawing elements using editing commands

ADDI-3.7 Complete assignments using specific software commands and processes

ADDI-3.8 Explain coordinate systems

Domain – Solving Design Challenges in Architectural Drafting

Core Standard 4 Students synthesize architectural knowledge to design and create solutions.

Standards

ADDI-4.1 Develop and draw a floor plan

ADDI-4.2 Draw a site plan

ADDI-4.3 Draw a foundation plan

ADDI-4.4 Interpret roof framing and calculations

ADDI-4.5 Draw wall sections

ADDI-4.6 Read construction documents

ADDI-4.7 Develop elevations

ADDI-4.8 Interpret schedules

ADDI-4.9 Interpret and apply required codes, standards, specifications, and cross-referencing

Domain – Careers in Architectural Drafting

Core Standard 5 Students evaluate architectural careers to prepare for future training and employment opportunities .

Standards

ADDI-5.1 Research architectural drafting careers

ADDI-5.2 Find architectural drafting opportunities offered by a technical school or college

ADDI-5.3 Determine architectural drafting occupation wages/salaries

ADDI-5.4 Research architectural drafting job outlook information

Process Standards

Common Core Literacy Standards for Technical Subjects

Reading Standards for Literacy in Technical Subjects 11-12

The standards below begin at grade 11 and define what students should understand and be able to do by the end of grade 12. The CCR anchor standards and high school standards in literacy work in tandem to define college and career readiness expectations – the former providing broad standards, the latter providing additional specificity.

Key Ideas and Details

11-12.RT.1 Cite specific textual evidence to support analysis of technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

11-12.RT.2 Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

11-12.RT.3 Follow precisely a complex multistep procedure when performing technical tasks; analyze the specific results based on explanations in the text.

Craft and Structure

11-12.RT.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific context relevant to *grades 11-12 texts and topics*.

11-12.RT.5 Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.

11-12.RT.6 Analyze the author's purpose in providing an explanation, describing a procedure, or

discussing an experiment in a text, identifying important issues that remain unresolved.

Integration of Knowledge and Idea

11-12.RT.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

11-12.RT.8 Evaluate the hypotheses, data, analysis, and conclusions in a technical subject, verifying the data when possible and corroborating or challenging conclusions with other sources of information.

11-12.RT.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

Range of Reading and Level of Text Complexity

11-12.RT.10 By the end of grade 12, read and comprehend technical texts in the grades 11-CCR text complexity band independently and proficiently.

Writing Standards for Literacy in Technical Subjects 11-12

The standards below begin at grade 11 and define what students should understand and be able to do by the end of grade 12. The CCR anchor standards and high school standards in literacy work in tandem to define college and career readiness expectations – the former providing broad standards, the latter providing additional specificity.

Text Types and Purposes

11-12.WT.1 Write arguments focused on *discipline-specific content*.

11-12.WT.2 Write informative/explanatory texts, including technical processes.

11-12.WT.3 Students will not write narratives in technical subjects. *Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In technical, students must be able to write precise enough descriptions of the step-by-step procedures they use in their technical work that others can replicate them and (possibly) reach the same results.*

Production and Distribution of Writing

11-12.WT.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

11-12.WT.5 Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

11-12.WT.6 Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.

Research to Build and Present Knowledge

11-12.WT.7 Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

11-12.WT.8 Gather relevant information from multiple authoritative print and digital sources,

using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectivity to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation

11-12.WT.9 Draw evidence from informational texts to support analysis, reflection, and research.

Range of Writing

11-12.WT.10 Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.